

*PE Mt. McKinley 66*

*PE 66-1*

PE-066-01

REPORT ON  
SHANNON LODE PROPERTIES  
Slippery Creek Area  
Kantishna Recording District, Alaska.

By

Earl R. Pilgrim

October 24, 1929

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*on outside of map see to package  
for file of 7/24/30*

Fairbanks, Alaska  
October 24, 1929

Mr. B. D. Stewart  
Territorial Mining Department  
Alaska Territory  
Juneau, Alaska

NOTED

NOV 14 1929

B. D. STEWART

Dear Sir:

I herewith present a brief report on the Shannon Lode Properties located in the Slippery Creek Area, Kantishna Recording District, Alaska. These claims were examined by me in September of this year. Five days were spent at the properties which was ample time considering the small amount of development work done on the claims. A careful examination was made of all outcrops and open cuts and a rough triangulation established using a brunton compass and an aneroid barometer. A map constructed from this work accompanies this report.

The Shannon Properties consist of the three groups listed below;

Slippery Creek- Iron Creek Copper Group *Kx 66-10*

Terminus Claim, Green Back Claim, Magnetite Claim, Old Sourdough

Native Copper Prospect *- Kx 66-38*

Question Mark Claim

Cinnibar-Antimony Deposit *- Kx 66-37*

Merinser Claim

Location

These claims are located in the Slippery Creek Area of Mt. McKinley National Park immediately to the north of Mt. McKinley at the heads of Iron Creek, Slippery Creek and the East Fork of Birch Creek. Shannon's Camp at the head of Slippery Creek is approximately  $9\frac{1}{2}$  miles from the center of Mt. McKinley and at an elevation of 3200 feet. The claims lie at elevations varying between 3400 feet and 4310 feet.

Transportation

This area can be reached at present by aeroplane or by pack animal in summer and by aeroplane or by dog team in winter.

From the end of the Park Highway, which is now completed to the East Fork of the Toklat River, it is approximately 70 miles by trail to this area. The Park Road is now completed 41 miles from McKinley Park Station on the Alaska Railroad. By aeroplane the property can be reached from Fairbanks within 2½ hours. A railroad constructed by the shortest available route would be approximately 108 miles in length to connect with the Alaska Railroad at Lignite or at Kobe. A highway would follow the present trail and be about 110 miles from McKinley Park Station.

#### Timber Available For Mining

The nearest timber available to this area is about 6 miles north in the Slippery Creek Valley and with an easy grade for hauling. This timber is within the park but extends along the valley for many miles and better timber can be found outside of the park line which is about 11 miles from Shannon's Camp. This timber is principally spruce and suitable for mining purposes only.

#### Fuel

There is no fuel available other than the possibility that a commercial seam of coal might be found in the coal formation, reported by the U.S.G.S and various prospectors, on Coal Creek a fork of Clear Water Creek a tributary of McKinley River. No details are known as to the size of any deposits but coal has been reported. It can be reached from Slippery Creek by a road approximately 20 miles in length.

#### Water Power

Most of the rivers and creeks on the north slope of the Alaska Range are fed from glaciers and carry such a great amount of gravel, sand, and mud that their waters could not be used for power development. Clear Water Creek as its name implies is a swift stream of clear water about 11 miles east of Slippery Creek. Clear Water Creek is fed from springs, rains and melting snows, and fluctuates much less in volume than neighboring glacier fed streams.

A rough estimate of the flow at times of crossing at its mouth where it empties into the McKinley River is 4,000 cubic feet per minute. This stream is said to have an excellent site for a dam and power plant several miles above its mouth.

Geology and Mineralization

The predominating rocks of this area consist of paleozoic ~~sediments~~ is sediments deformed, tilted and penetrated by a large number of intrusives. These sediments, ("Post-Tonzona" Capps in "Toklat-Tonzona River Region U.S.G.S. Bull.792, 1925 ) consist of argillites, shales, slates, and thin bedded limestones in places much silicified and mineralized by contact metamorphism. The intrusives occur as dikes, and sills generally trending parallel to the strike of the sediments. They vary in composition and structure from granite to diabasic porphyry.

As we have divided the Shannon holdings into three groups it is necessary to describe three distinct types of mineralization as they must be each considered separately.

Slippery Creek - Iron Creek Copper Group

This mineralization is distinctly a contact metamorphic mineralization in which older limestones, determined by Mr. Hopkins as a dolomite ( His report of Oct.9 1929 Sample No. A,B, and C.), have been intruded by granitic rocks altering the sediments and introducing the metallic minerals. These minerals have replaced the sediments in a more or less irregular sequence with the predominating minerals depositing first. The probable order of replacement is magnetite, chalcopyrite, sphalerite, pyrite, pyrrothite, and galena. This order does not hold true however in all outcrops examined. The two largest exposures on this mineralization at Iron Creek and at Slippery Creek show very little magnetite while at the Terminus Discovery Outcrop and the Magnetite Discovery Cut the magnetite predominates over all other metallic minerals by two to one. A hand specimen taken at the open cut Magnetite Discovery shows massive black fine grained magnetite with small seams

and fractures filled with chalcopyrite and sphalerite.

The mineralizing intrusive is a granitic dike cutting almost vertically through the sediments. Its width was not determined but is at least several hundred feet. Its strike along the contact is about N 40° E. or parallel to the bedding planes of the limestone. Directions taken in the limestones at various points on the four claims show strikes of from North to N 50° E. with a general average of about N. 30° E. and a dip of from 60° S.E. to vertical. Smaller dikes or tongues extend out to the side and penetrate the sedimentary. These are similar to the parent dike except for a considerable loss of silica and darker minerals in replacing the lime. The lime is altered greatly close to these contacts. An excellent example of these tongues is shown in photograph marked "D". This is a photograph of the large outcrop at the head of Slippery Creek on the Green Back Claim.

The mineralization has extended into the sedimentaries for considerable distances. A measurement across the exposure on Iron Creek shows a copper-iron mineralization of 150 feet in width while a similar measurement on the large outcrop on Slippery Creek shows 330 feet measured at N. 54° E and reduces to 180 feet across the strike. Also from the float showing on the hillsides and the mineralization showing in several cuts, one is lead to expect as great a width in other places.

Very little work has been done on these claims and the principal exposures available for examination are natural ones. These surface outcrops are somewhat oxidized and leached, although not to a depth of over a few feet, and show much copper carbonate coatings as well as iron oxide. The copper mineralization although very extensive along this contact, in no place shows any appreciable quantity of high grade ore. All evidence points to a possible large low grade deposit of chalcopyrite, sphalerite ore.

Nineteen samples were taken on this group of claims, only

one of which represents an average width and value. Most of the opencuts are small and only expose the deposit at one point. A sample taken there would not represent any definite width or section. The samples taken are described below;

- Sample No. 1. Thirty feet above creek level on Slippery Creek  
Outcrop 30 feet N.E. of west limit of mineralization.  
Grab sample showing chalcopyrite Green Back Claim.
2. Channel sample iron stained leached gouge on W. side  
of open cut Magnetite Discovery Cut. 10 in. wide.
  3. Channel sample across 8'-1" from Sl. No. 2 east to  
edge of mineralization. massive magnetite with chal-  
copyrite, sphalerite, and small amounts of galena.  
Apparently faulted on west side.
  4. Picked pieces from large outcrop on Slippery Creek  
showing chalcopyrite, sphalerite, and pyrrhotite. This  
represents as high grade ore as could be found on  
this outcrop.
  5. Grab sample from Terminus Discovery Outcrop showing  
magnetite, chalcopyrite, and sphalerite.
  6. Grab sample decomposed ground up material on local  
fault cutting through big Iron Creek Outcrop near  
east edge of outcrop.
  7. Picked pieces iron rock from Iron Creek Outcrop.
  8. Pieces altered limestone on Iron Creek Outcrop rep-  
resents large portion of outcrop.
  9. Picked pieces from Magnetic Claim best ore .
  10. Broken pieces grab sample east side Iron Creek Outcrop  
at creek level.
  11. Grab sample from Iron Creek Outcrop 20 feet above No. 1  
sample No. 10.
  12. Grab sample Terminus Discovery across 8 feet just  
below discovery post.

- Sample No. 13. Same as Sample marked A.
14. Picked Specimens not assayed
15. Oxidized rock from Slippery Creek Outcrop large portion outcrop this material.
16. Green Back Claim Slippery Creek copper carbonate and black mineral.
- 1A. Showing minerals contained in average contact.
- B. Tested for non metallic minerals.
- C. Tested for limestone.
19. Grab sample of contact deposit porphyry-limestone on ridge below copper peak, west side of limestone marked mineralized open cut No. 4. on map.

Assays of these samples are listed below;

Sample No.	Gold	Silver	Copper	Lead	Zinc	Iron
1.	Trace	1.00	3.5			
2.	0.03	0.80	0.6			
3.	0.01	0.20	0.3			
4.	0.04	4.80	6.7	0.0	23.5	12.6
5.	0.02	1.60	1.6	0.0	2.2	16.8
6.	0.01	0.10	0.0	0.0		
7.	0.01	0.20	0.4	0.0	0.1	17.2
8.	Trace	0.60	0.0			
9.	0.01	5.40	5.6	2.3	4.8	20.1
10.	0.01	0.20	0.2	0.0	0.2	15.4
11.	0.06	1.80	1.7	0.0	0.3	24.4
12.	0.02	0.40	1.5	0.0	0.6	5.6
13.	0.02	0.30	0.0			
19.	Trace	Trace	0.0	1.9		12.9-

### Native Copper Prospect

The Question Mark Claim is shown on map accompanying this report. It lies about one mile west of Shannon's Camp on Slippery Creek and at an elevation of 3600 feet. The lode is a greenstone dike striking east-west and dipping steeply to the north. This dike is from 30 to 50 feet in width and is plainly to be traced along the surface for several hundred feet by a red covering of residual hematite. The lode is bounded on the north by a dark diabasic porphyry rock and on the south by a green porphyritic rock, probably diorite. The greenstone contains a number of stringers of calcite which appear barren of any other minerals where examined.

The native copper occurs finely distributed in the greenstone in minute specks and in fine irregular threads. No work has been done on this claim and there are no outs or fresh exposures to examine and no information is available as to the extent of the mineralization throughout the greenstone. A microscopic examination will be necessary to clear up the source of the copper. No other copper minerals were observed either as sulphides or as oxidized products. It is very probable that this occurrence is a common one in which the native copper occurring in the basic igneous rock is associated with minerals of the zeolite group. This deposit may be of economic importance but considerable work must be done on it to open it up for examination before any definite value can be given it.

Two samples were taken on this lode;

Sample No. 17. Grab sample from pieces broken off of lode at outcrop 300 feet west of West fork of Slippery Creek. Extent of this ore not known but apparently considerable. Lode about 50 feet wide but sample represents only 5 feet. Remainder of lode covered by iron stained capping and slide rock.



Sample No. 18. Decomposed iron oxide covering lode taken along side of cut of sample No. 17.

Sample No.	Gold	Silver	Copper	Iron Soluble
17	Trace	Trace	1.8	11.6
18	0.01	0.10	Trace	8.9

Cinnibar-Antimony Deposit

The Merinser Claim is located a little over two miles west of Shannon's Camp on Slippery Creek and covers elevations of from 3400 feet to 3820 feet. A group of highly altered steeply pitching sedimentary rocks strike in a direction of N. 40° E. In this formation, at the crest of a sharp ridge extending in a northerly direction on the north flank of a mountain, is an outcrop showing specks and flakes of cinnibar disseminated through the rock in small amounts. There are a number of calcite stringers cutting the rock and they also carry cinnibar in slightly greater amounts than the sedimentary rock. This mineralization shows exposed across a width of 37 feet with small amounts of cinnibar, lesser amounts of metacinnibar and an occasional globule of native mercury. The highest grade portion of this deposit appears to be along the west side where the calcite stringers appear the more numerous. There are no contacts or walls or change in the character of the rock on either side of this deposit.

About 200 feet south east and 50 feet lower in elevation there is a granitic dike cutting across the formation with a strike of S. 45° W. and a dip of 30° to the east. This dike may have some relationship to this cinnibar deposit. Apparently the deposit is a low grade dissemination in porous rock.

No work has been done on this deposit other than an open cut near the top of the ridge crosscutting the deposit. Five samples were taken across this width of 37 feet and one special sample;

Sample No. 20 Starting at northwest side of deposit 0-6 feet  
best ore in this sample.

21. 6--12 feet.

22. 12--18 feet.

23. 18--26 feet.

24. 26--37 feet

25. Picked pieces of the best ore showing taken from  
northwest edge of deposit on top of ridge, several  
calcite stringers cutting through.

Sample Number	Mercury	Sulphur	Gold	Silver
20.	0.07			
21.	0.03			
22.	0.02			
23.	0.03			
24.	0.03			
25	0.20	Trace	Trace	Trace
Composite No. 20-24 incl.	0.03	"	"	"

#### Stibnite Vein

About 200 feet lower and 500 feet southwest of the  
cinnibar prospect, there is an antimony vein outcropping on  
the side of the mountain. This outcrop can be traced for sever-  
al hundred feet along the mountain side by the brown stained  
float which shows below the vein. This vein has a strike of  
N. 50° E, and a dip of 30° to the southeast. The vein varies in  
thickness of from a few inches to over 11 feet.

Several cuts have been dug along the outcrop but  
were sluffed in to a considerable extent. Good pure stibnite  
was noted piled along these cuts. One cut near the northern  
extremity of the outcropping vein was cleaned out and ~~the~~ the  
vein sampled across a width of 11 feet 6 inches. The vein here

showed about 4 inches of solid stibnite on the foot wall, 5 inches of it on the hanging wall, and several stringers scattered across the face. The gangue rock is a milky quartz with much soft brown decomposed quartz, and antimony oxide. The vein shows about 2 inches of black gouge on the foot wall. Both wall rocks are black shaley limestone.

From the amount of float scattered along the mountain-side below the strike of the vein one is lead to expect a considerable extent to the stibnite along the vein but probably greatly intermixed with the gangue.

Two samples were taken from this vein and a special piece from another reported antimony lead about five miles southwest of the ~~Mer~~rinser Claim;

Sample Number 26. 11'-6" across vein channel sample

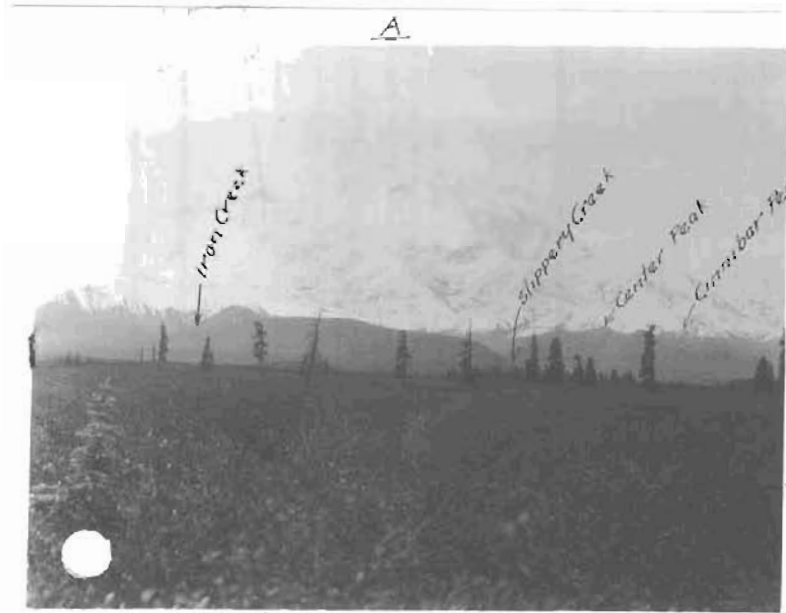
27. Picked pieces from six outcrops representing sorted ore from several piles along vein.

28. Ore from big lead reported 5 miles southwest.

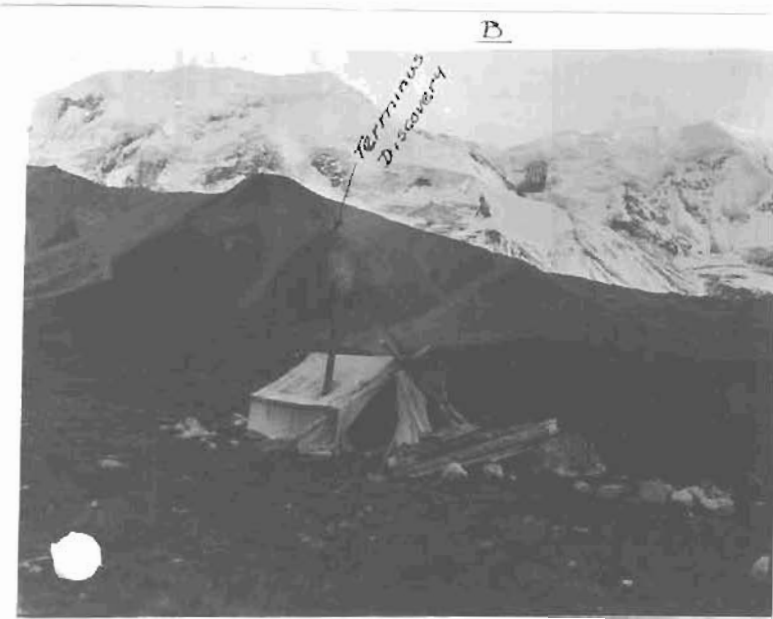
Sample Number	Gold	Silver	Antimony	Lead	Copper	Zinc	Arsenic	Sulphur	Iron
26.18	0.18	0.10	7.2	None	None	None	0.85		
27.	Trace	Trace	56.7	None	None	None	0.18	21.4	3.2
28.			33.5	None	None	None	0.12		

Respectfully Submitted,

*Earl R. Pilgrim*



About 6 miles from Camp on Slippery

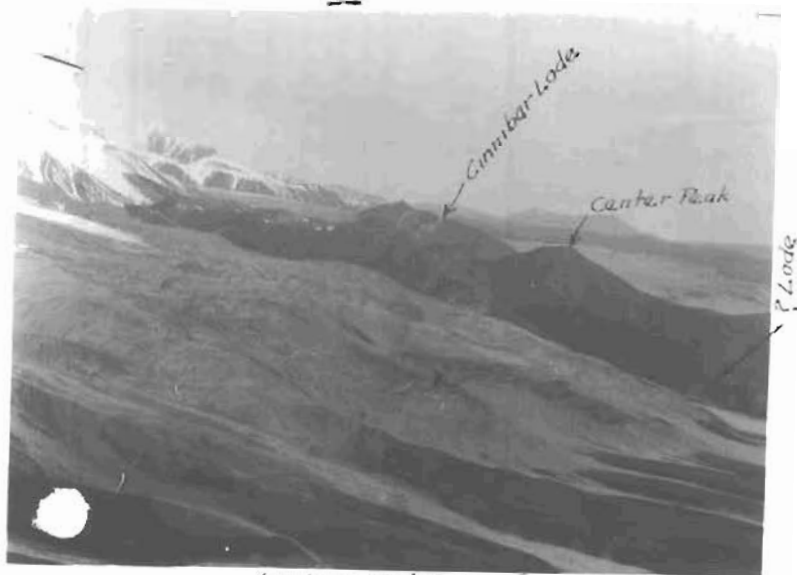


B

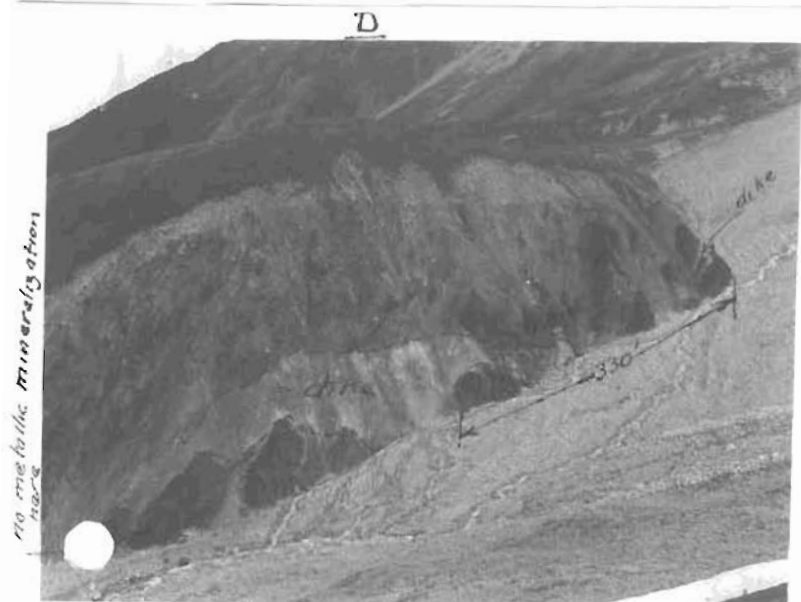
Report on Shannon Property  
Slippery Creek Kantishna Dist.

A

Report. Shannon Property  
Slippery Creek Kantishna Dist.



Looking S.W. from Copper Peak



Looking N8°E to Disc. Big Outcrop on Slippery Greenback

D

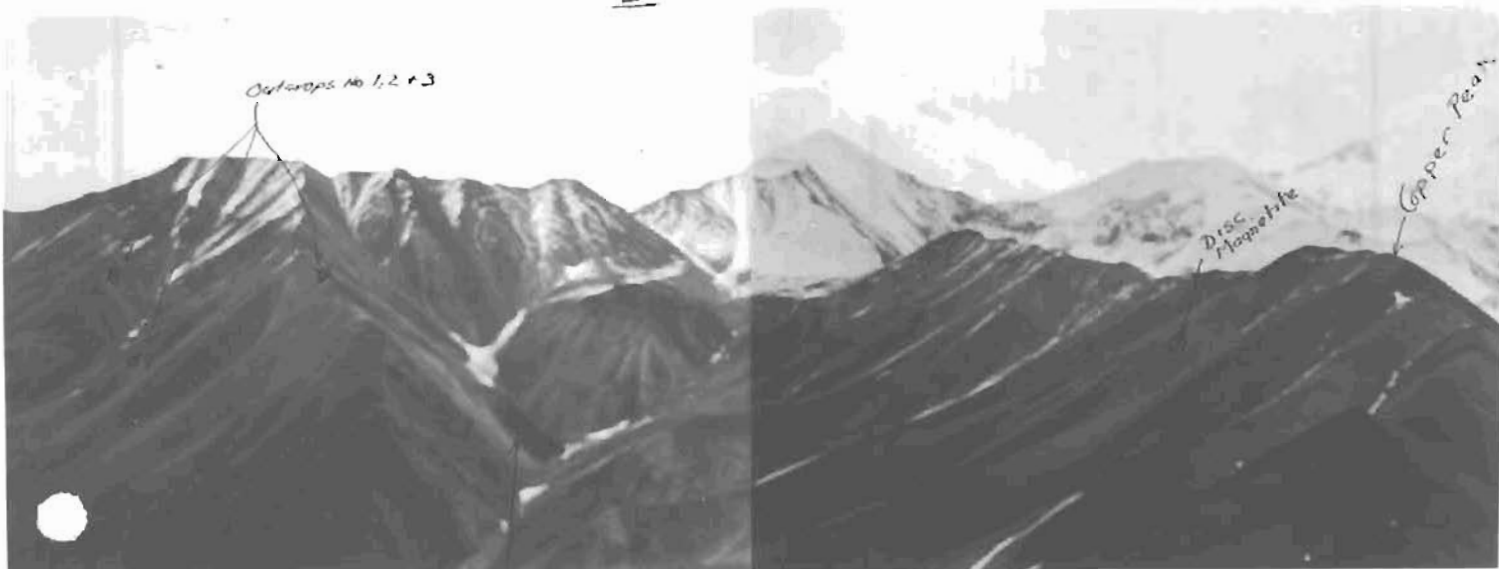
Report. Shannon Property  
Slippery Creek Kantishna Dist.

C

Report on Shannon property  
Slippery Creek Kantishna Dist.

E

Outcrops No 1, 2 & 3



DISC Monzonite

Copper Peak

Big Outcrop on Irish Creek

E

Report on Shannon  
Property Slippary Creek  
Kantishna Dist.



Big Outcrop on Greenback Cliffs  
Looking N25°W.

IN ANSWERING REFER TO No.

UNITED STATES  
DEPARTMENT OF COMMERCE

BUREAU OF MINES  
Fairbanks, Alaska  
Oct. 9, 1929

Mr. E. R. Pilgrim,  
Territorial Mining Engineer,  
Fairbanks, Alaska.

Dear Mr. Pilgrim;

Minerals have been identified in your samples  
as follows;

Sample A contains considerable chalcopryrite also considerable sphalerite and probably pyrite. The gangue appears to be a highly altered limestone, now consisting mainly of a greenish silicate which appears to be in the pyroxene class, probably a variety of augite. No lead was seen in the sample.

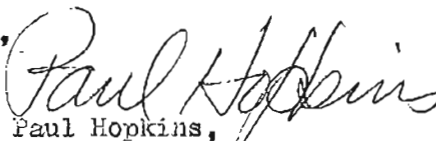
Sample B consists mainly of silicates such as the augite of the previous sample with smaller amounts of epidote and similar minerals. It contains a small amount of chalcopryrite and a trace of zinc. No lead minerals were found.

Sample C is a dolomite containing a considerable amount of silicates as in sample B. A very small amount of galena is present and a trace of zinc. No copper was found.

The sample marked Shannon 16 is a dolomite containing a small amount of copper in the form of malachite. The soft dark mineral coating some of the surface is a manganese oxide, probably pyrolusite. This sample contains less of the complex silicates than the preceding samples.

The reddish mineral in sample Shannon 18 is an iron oxide, possibly hematite. It occurs as microscopic included particles. It was not possible to concentrate the red mineral by careful panning.

Very truly yours,

  
Paul Hopkins,  
Assoc. Anal. Chemist,  
U. S. Bureau of Mines.

3762-66



# Alaska Agricultural College and School of Mines

In Cooperation with  
U. S. Bureau of Mines, Department of Commerce

College, Alaska

Oct. 18, 1929

## REPORT OF ASSAY Mr. E. R. Pilgrim, Territorial Mining Engineer

On samples received from .....

Assay No.	Mark on Sample	OUNCES PER TON		NET Value PER TON Copper	PERCENTAGE OF			
		Gold	Silver		Lead	Zinc	Iron (soluble)	Arsenic
01008	Shamon #1	Trace	1.00	3.5				
01009	" 2	0.03	0.80	0.5				
01010	" 3	0.01	0.20	0.3				
01011	" 4	0.04	4.80	6.7	0.0	23.5	12.6	
01012	" 5	0.02	1.60	1.6	0.0	2.2	16.8	
01013	" 6	0.01	0.10	0.0	0.0			
01014	" 7	0.01	0.20	0.4	0.0	0.1	17.2	
01015	" 8	Trace	0.60	0.0				
01016	" 9	0.01	5.40	5.6	2.3	4.8	20.1	
01017	" 10	0.01	0.20	0.2	0.0	0.2	15.4	
01018	" 11	0.03	1.80	1.7	0.0	0.3	24.4	
01019	" 12	0.02	0.40	1.5	0.0	0.6	5.5	
01020	" 15	0.02	0.30	0.0				
01021	" 17	Trace	Trace	1.8			11.6	
01022	" 18	0.01	0.10	Trace			8.9	
01023	" 19	Trace	Trace	0.0	1.9			Trace

Assayed by,

*Paul Hopkins*  
Paul Hopkins,  
Associate Anal. Chemist,  
U. S. Bureau of Mines.

Official

Total charges for above assays.....

Amount received from sender.....

# Alaska Agricultural College and School of Mines

In Cooperation with  
U. S. Bureau of Mines, Department of Commerce

College, Alaska

## REPORT OF ASSAY

Oct. 26, 1929

On samples received from Mr. E. R. Pilgrim, Territorial Mining Engineer

Assay No.	Mark on Sample	OUNCES PER TON		Value Per Ton	PERCENTAGE OF			
		Gold	Silver		Mercury	Sulphur		

01027	Shannon #20							0.07	
01028	" 21							0.03	
01029	" 22							0.02	
01030	" 23							0.03	
01031	" 24							0.03	
01032	" Composite	Trace	Trace					0.03	Trace
01033	" 25	Trace	Trace					0.20	Trace

### Percentage of

Antimony Lead Zinc Copper Arsenic Sulphur Iron

01034	" 26	0.18	0.10	7.2	None	None	None	0.86		
01035	" 27	Trace	Trace	56.7	None	None	None	0.18	21.4	3.2
01036	" 28			32.5	None	....	None	0.12		

Assayed by,

*Paul Hopkins*

Paul Hopkins,  
Assoc. Anal. Chemist,  
U. S. Bureau of Mines.

Total charges for above assays..... Official  
Amount received from .....

Honolulu Station,  
Mile 289 Alaska Ry.,  
October 24, 1929.

Mr. B. D. Stewart,  
Territorial Supervisor of Mines,  
Juneau, Alaska.

U. S. GEOLOGICAL SURVEY  
RECEIVED  
OCT 30 1929  
JUNEAU, AL

Dear Sir:

Mr. Earl R. Pilgrim, Mining engineer, whom you delegated to examine and report upon my mining properties in the Kantishna District, has completed his examination of the properties.

I met Mr. Pilgrim at Copper Mountain, Kantishna, the evening of August 31<sup>st</sup> and on September 2<sup>nd</sup> we left for Slippery Creek, where my claims are, and arrived at the claims on the morning of September 4<sup>th</sup>, but could easily have made it to the claims the evening of September 3<sup>rd</sup> had we not laid over

at my camp in the upper timber of Slippery creek, the afternoon of September 3<sup>rd</sup>, on account of a rain storm, the 4<sup>th</sup>; 5<sup>th</sup>; 6<sup>th</sup>; 7<sup>th</sup> and 8<sup>th</sup> of September, we spent in going over the property, examining the outcrops, collecting samples and specimens, measuring the outcrops, and examining the country rock near the deposits.

We brought in, with us, to the Railroad, about seventy, (70), pounds of samples and specimens, mostly specimens, because, as Mr. Pilgrim said, "owing to the lateness of the season, and therefore lack of sufficient time before snowfall, and also the number and great size of the outcrops, he would not begin to have anywhere near time to take average samples," however, to my mind, he accomplished almost as much as though he had taken average samples, because there is no underground workings on the property and the surface appears to be considerably leached on most of the outcrops, therefore an average sample taken at the surface, and especially on the

Copper Mineralization, would be no criterion of the Commercial or Non Commercial Value of the deposits, as I see it.

Should Mr. Pilgrim's report on my Properties prove favorable are we going to let the matter rest there? Why not go right on through and help me to develop a mine, if a mine be there, that is develop sufficient tonnage, if present, to warrant the building of a branch railroad to connect the Properties with the Alaska Railroad, by furnishing labor and supplies to be used in the prosecution of said development, and under the direction of a Mining Engineer appointed by the Supervisor of Mines, - that may seem absurd to you Mr. Stewart, but to my mind it is more logical to spend territorial monies in giving material assistance to the prospector in developing his find, providing it has been favorably reported upon by a Mining Engineer in the employ of the Territory, than by just having an examination and

report made on the properties, and nothing more, because no single prospector, during a natural lifetime, could hope to develop sufficient tonnage to warrant the building of a hundred miles of railroad, and the prospects which I have, judging from surface indications, give every promise of containing sufficient tonnage.

During a recent conversation which I had with General Manager Ohlson of the Alaska Railroad, he mentioned something about the U.S. Geological Survey going to take over this work, I can see no advantage in that, I believe you inaugurated this service for the prospectors of the Territory, and in my opinion it should remain under your direction, and I take this opportunity to thank you for the service you have already caused to be performed in my behalf.

Sincerely yours,  
W. Shannon

UNITED STATES  
DEPARTMENT OF COMMERCE  
BUREAU OF MINES  
Fairbanks, Alaska  
Oct. 9, 1929

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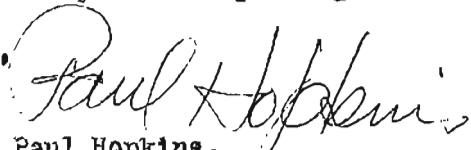
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In Cooperation with  
U. S. Bureau of Mines, Department of Commerce

College, Alaska

Oct. 26, 1929

## REPORT OF ASSAY

On samples received from Mr. E. R. Pilgrim, Territorial Mining Engineer

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		Gold	Silver		Mercury	Sulphur					
01027	Shannon #20				0.07						
01028	" 21				0.03						
01029	" 22				0.02						
01030	" 23				0.03						
01031	" 24				0.03						
01032	" Composite	Trace	Trace		0.03		Trace				
01033	" 25	Trace	Trace		0.20		Trace				
					<u>Percentage of</u>						
					Antimony	Lead	Zinc	Copper	Arsenic	Sulphur	Iron
01034	" 26	0.18	0.10	7.2	None	None	None	0.85			
01035	" 27	Trace	Trace	56.7	None	None	None	0.18	21.4	3.2	
01036	" 28			33.5	None	....	None	0.12			

Assayed by,

*Paul Hopkins*  
Paul Hopkins,  
Assoc. Anal. Chemist,  
U. S. Bureau of Mines.

Total charges for above assays..... Official

Amount received from sender.....



# Alaska Agricultural College and School of Mines

In Cooperation with  
U. S. Bureau of Mines, Department of Commerce

College, Alaska

Oct. 18, 1929

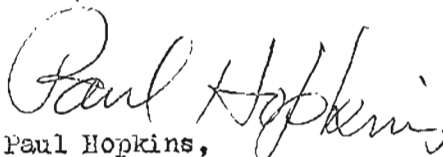
## REPORT OF ASSAY

Mr. E. R. Pilgrim, Territorial Mining Engineer

On samples received from .....

Assay No.	Mark on Sample	OUNCES PER TON		Copper	PERCENTAGE OF			
		Gold	Silver		Lead	Zinc	Iron (soluble)	Arsenic
01008	Shannon #1	Trace	1.00	3.5				
01009	" 2	0.03	0.80	0.6				
01010	" 3	0.01	0.20	0.3				
01011	" 4	0.04	4.80	6.7	0.0	23.5	12.6	
01012	" 5	0.02	1.60	1.6	0.0	2.2	16.8	
01013	" 6	0.01	0.10	0.0	0.0			
01014	" 7	0.01	0.20	0.4	0.0	0.1	17.2	
01015	" 8	Trace	0.60	0.0				
01016	" 9	0.01	5.40	5.6	2.3	4.8	20.1	
01017	" 10	0.01	0.20	0.2	0.0	0.2	15.4	
01018	" 11	0.06	1.80	1.7	0.0	0.3	24.4	
01019	" 12	0.02	0.40	1.5	0.0	0.6	5.6	
01020	" 15	0.02	0.30	0.0				
01021	" 17	Trace	Trace	1.8			11.6	
01022	" 18	0.01	0.10	Trace			8.9	
01023	" 19	Trace	Trace	0.0	1.9			Trace

Assayed by,



Paul Hopkins,  
Associate Anal. Chemist,  
U. S. Bureau of Mines.

Official

Total charges for above assays.....

Amount received from sender.....